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71. Proposed by J. C. CORBIN, Pine Bluff, Ark.

Form the differential equation of the third order, of which

$$y=c_1 e^{2x} + c_2 e^{-3x} + c_3 e^x \text{ is the complete primitive.}$$

72. Proposed by G. B. M. ZERR, A. M., Ph. D., President and Professor of Mathematics, The Russell College, Lebanon, Va.

A man has a park in the form of a parabolic segment cut off by a chord making an angle $\pi/4$ with the axis. Within the park is a right angled triangular flower plat with one vertex at the center of gravity of the segment, the other vertex at the lower extremity of the chord, and the right angle on the diameter bisecting the chord. The park contains 30 acres, and the perimeter of triangle in linear measure equals the area in square measure. Find the length of the chord, the latus-rectum of the parabola, and the dimensions of the triangle.

* * * Solutions of these problems should be sent to J. M. Colaw, not later than April 10.

MECHANICS.

64. Proposed by B. F. FINKLE, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

A cylindrical vessel, radius of vessel r and altitude h , is filled with water and rests on a horizontal plane. It is required to ascertain the maximum angle of elevation to which the plane may be raised without the vessel falling, allowing the coefficient of friction to be such as to prevent sliding, and the water to overflow as the plane is raised.

65. Proposed by G. B. M. ZERR, A. M., Ph. D., President and Professor of Mathematics, The Russell College, Lebanon, Va.

The distance, parallel to the axis, from the mid-point of a chord to the arc of a parabola is constant. Show that the center of gravity of all segments formed by the chord is an equal parabola.

* * * Solutions of these problems should be sent to B. F. Finkel, not later than April 10.

DIOPHANTINE ANALYSIS.

62. Proposed by JOHN M. ARNOLD, Crompton, R. I.

Find, if possible, four square numbers in arithmetical progression.

63. Proposed by A. H. HOLMES, Brunswick, Me.

Given $x^2 + y^2 = 20^3 \times 105498$, to find four positive integral values each for x and y .

64. Proposed by SYLVESTER ROBINS, North Branch Depot, N. J.

It is required to take from the proper key suitable material and hastily construct a "nest" of 10 or 15 prime, integral, rational trapeziums, each containing an area equal to the square root of the product of its four sides.

65. Proposed by MANSFIELD MERRIMAN, Professor of Civil Engineering, Lehigh University, South Bethlehem, Pa.

Show that the number 1521 can be expressed in seven different ways as the sum of three perfect squares? Can more than seven different ways be found?

* * * Solutions of these problems should be sent to J. M. Colaw, not later than April 10.